Saskatchewan Ministry of Agriculture

CROP PRODUCTION

CROP PRODUCTION NEWS

Volume 31, No. 2 **June 3, 2009**

PRODUCTION

Editor's Comments

Faye Dokken, Crops Branch, Saskatchewan Agriculture

Earlier this year, the Ministry of Agriculture was pleased to announce the expansion of rural extension services in Saskatchewan.

Extension services are still available from the Agriculture Knowledge Centre and there are now a total of 10 regional offices. Each regional office is staffed with crops, livestock, forage and farm business management specialists.

The Regional Crops Specialists are available to provide the latest production information to producers, with specific expertise on local conditions. They are also available for on-farm visits and to meet with producers and agronomists one-on-one.

The Regional office staff, the Agriculture Knowledge Centre and the Provincial Specialists from Crops Branch will continue to work cooperatively with local agronomists to provide farmers with the best information possible.

How can I access information from the Regional Services and Crops Branches?

- For more information on crops, visit www.agriculture.gov.sk.ca/crops.
- For answers to production issues, visit www.agriculture.gov.sk.ca/Production.
- Visit www.agriculture.gov.sk.ca/RegionalDevelopmentTeams and contact your closest regional office or call the Agriculture Knowledge Centre at 1-866-457-2377.
- Submit weed, insect, or plant disease samples to the Crop Protection Laboratory.

NOTE: Throughout this document, you will see that some publications are in blue font and underlined, indicating links to website information. If you are reading this off your computer screen, press the CTRL button and click your cursor on the link to take you directly to the website. ☼

Crop Production News is a biweekly publication prepared primarily by provincial specialists with the Crops Branch of the Saskatchewan Ministry of Agriculture. It is a compilation of articles related to entomology, plant pathology, weed science, soils and agronomy issues.

Please do not use any of these articles for any other purpose without first asking the author's permission.

If you wish to be added to or removed from our mailing list, forward your request by email to: sean.miller@gov.sk.ca

INSIDE

Insects in Cool Weather.....2
Registration of Nolo Bait for Grasshopper Control.....2
Upcoming Cereal Varieties.....3
Sulphur and Alfalfa.....4
Forage Production Outlook 2009 6
Phosphate, sulphur deficiencies, and in-crop nitrogen considerations.....7
Crop Development in Cool Conditions.....9
Authority Registration Update.....12

Insects in Cool Weather

By Scott Hartley, Provincial Specialist, Insects and Vertebrate Pests

There have been no serious insect concerns noted from producers so far this spring. This is largely related to the very cool conditions experienced across the Province. Temperature plays an important role in the development of the stages of an insect's life cycle. Degree days, a measure of accumulation of heat units above a specific base temperature, have been all but non-existent during April and May.

There have been reports of limited flea beetle activity on cruciferous weeds and volunteer canola. Flea beetles over-winter as adults and therefore will become active as temperatures increase.

Insect monitoring programs - Diamondback moth:
Pheromone traps have been set up at a number of sentinel locations in Saskatchewan including Agri-ARM sites. The risk from diamondback moths is also being evaluated by Agriculture and Agri-Food Canada who monitors wind currents carrying the moths into Prairie locations from the southern United States and Mexico.

There have been no reports of moths in traps so far this spring but wind trajectories originating in the southern United States during May 20 and 21 had potential for carrying diamondback moths into the Prairies.

Insect monitoring programs - Bertha Armyworm:
Pheromone lures, vapona (fumigant) insecticide strips and traps are being sent out in preparation for the 2009 Bertha Armyworm monitoring program. Although the traps are usually set up in early June, the cool conditions will have slowed development of the adult moths within the pupae. Similar to last year, it is anticipated that there will not be many moths emerging before the third week in June. However, if participants know in advance where their traps will be located it would be appreciated if land descriptions are forwarded to 1-888-323-7842 or sean.miller@gov.sk.ca to allow preparation of the Bertha Armyworm risk map. ☼

Registration of Nolo Bait for Grasshopper Control

By Scott Hartley, Provincial Specialist, Insects and Vertebrate Pests and Chantal Jacobs, Provincial Specialist, Organic Crops

There has been a recent registration of Nolo Bait (*Nosema locustae*), a microbial insecticide for grasshopper control. This is an organic control option, acceptable for most organic groups. However, organic producers should check with their specific certifying body to ensure compliance with applicable organic standards.

Nolo Bait is produced by M & R Durango of Colorado, United States. Although it has been registered in the United States for many years, attempts made to register this product in Canada were unsuccessful until the spring of 2009.

(Continued on page 3)

Registration of Nolo Bait for Grasshopper Control
(Continued from page 2)

Due to the recent registration, distribution arrangements are still under development. Contact the company directly at the address below to obtain this product for this growing season. The *Nosema locustae* is formulated on wheat bran bait that must be consumed by the grasshoppers to be effective.

Nolo Bait is a microsporidian pathogen (single-celled organism that lives parasitically inside the cells of certain insects). There are advantages to products like Nolo Bait in that it is specific to grasshoppers and does not affect beneficial insects and other organisms. However, because this product is slow acting and not like a traditional chemical insecticide that offers quick knock down of the insect pests, it is necessary to apply the product to populations earlier in the season when the grasshoppers are young, before the more damaging later stages. The effect of Nolo Bait is considered to be suppression.

Nolo Bait is registered for the major crops that are susceptible to grasshopper feeding including cereals (wheat, barley, oat and rye), pulse crops (lentil, pea, chickpea) and alfalfa. The product is also registered for use in pasture and rangeland. ✡

M & R Durango, Inc.
P.O. Box 886
Bayfield, CO 81122
phone: (800)526-4075, fax: (970)259-3857, email: mail@goodbug.com

Upcoming Cereal Varieties

By Blaine Recksiedler, Provincial Specialist, Cereal Crops

Prairie recommending committees for variety registration meet every year to evaluate candidate cultivars. Recommendations are made to the Variety Registration Office of the Canadian Food Inspection Agency regarding suitability for registration in western Canada. In 2009, the Wheat, Rye and Triticale committee supported 19 cultivars for registration. It will take three to four years of seed multiplication before these varieties are available for commercial production.

Cereal Harvest 2008
Source: Saskatchewan Agriculture.

Nine Canada Western Red Spring wheat cultivars

Individual cultivars offer different features, but overall agronomic highlights from this group include: wheat midge resistance (*Sm1* gene); improvements in fusarium head blight, rust and leaf spot resistance; increased yield coupled with good straw strength; and tolerance to Clearfield herbicides. The overall agronomic picture of this group was quite impressive.

(Continued on page 4)

Upcoming Cereal Varieties
(Continued from page 3)

One Canada Western Hard White Spring wheat variety (Snowstar)
This variety had interim registration and now has received the recommendation for full registration. It is a short and strong strawed variety with good leaf and stem rust resistance. It is best adapted to the longer growing season areas of the prairies, particularly Manitoba and eastern Saskatchewan.

Two Canada Prairie Spring White wheat varieties
These varieties, Snowhite475 and Snowhite476, were supported for two years of interim registration to accommodate 'flushing' seed out of the commercial and pedigreed system, as they will be de-registered.

One Canada Prairie Spring Red wheat cultivar
This cultivar shows resistance to wheat midge (*Sm1* gene), shows consistently high yield across all zones on the prairies, and has good rust resistance.

Five Canada Western General Purpose wheat cultivars
Three varieties are winter wheat and two are spring wheat. These cultivars feature combinations of yield and disease resistance performance, depending on area of adaptation.

One Canada Western Amber Durum cultivar
This is a conventional type durum offering high grain yield, high test weight and good pigment, with improvements in fusarium head blight resistance. ☼

Sulphur and Alfalfa

By Michel Tremblay, Provincial Specialist, Forage Crops

Alfalfa is a nutritious and high-yielding perennial forage that is widely used in Saskatchewan for hay, pasture, seed production and silage. Like canola, alfalfa is a heavy user of sulphur, removing approximately five to seven pounds of sulphur from the soil for every ton of forage produced.

Sulphur is a contributor to many plant functions, including cell division, fat formation, seed formation, crop maturation, lateral and fibrous rootlet development, forage quality and disease resistance. Sulphur is also important in amino acid structure and enzyme activity. Sulphur deficiency in alfalfa results in stunted, spindly plants.

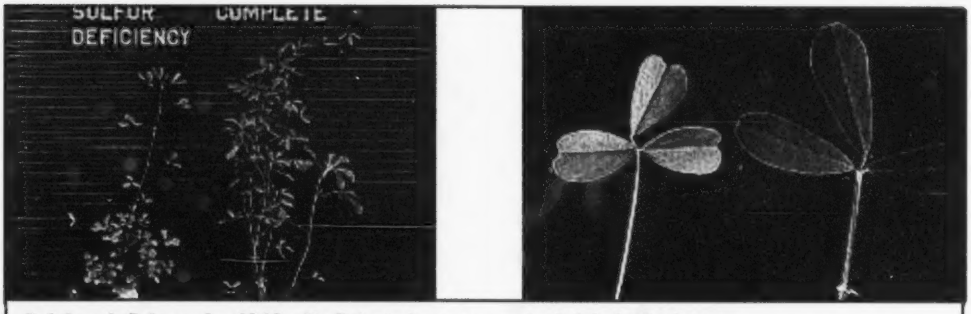
Foliar symptoms from a sulphur deficiency occur in the youngest leaves first, with leaves becoming light green or yellow in colour. Deficient plants may have reddish-coloured stems. When sulphur is limiting, a reduction in nodulation may occur. In order to achieve optimal nitrogen use, sulphur and nitrogen must be present at the appropriate ratio.

(Continued on page 5)

(Continued from page 4)
Sulphur is usually limited in supply on soils with low organic matter and/or low clay content. Fields, which frequently grow alfalfa or canola, light textured soils and gray soils, are more likely to have low sulphur levels.

Sulphur and Alfalfa

Soil sulphur levels generally decrease over time, especially when continuous alfalfa cropping with no return of sulphur to the soil in the form of fertilizer has occurred. Sulphur is mobile in the soil and can leach to lower soil profiles, especially in coarse-textured soils. Due to alfalfa's deep root system, alfalfa can access sulphur that is out of reach of annual crops.



Sulphur deficiency in alfalfa. Deficient plants are on the left in both pictures.
Source: Montana State University.

Sulphate-sulphur is the plant-available form of sulphur. Sulphate is mobile in the soil and moves more slowly in heavy-textured soils. Sulphur fertilizers are available in three main forms. Sulphate-sulphur is highly available and is usually formulated with a nitrogen source to create ammonium sulphate. Ammonium sulphate can supply sulphur to the crop immediately after being banded into the soil. Broadcasting is also an effective means of applying ammonium sulphate.

Elemental sulphur can be used to remedy low soil-sulphur conditions, but may take two or more years to be converted into the sulphate form that is available to plants. Elemental sulphur is best broadcast on the soil surface to allow the product to break down by weathering prior to oxidation to the sulphate form by specific soil organisms. Ammonium thiosulphate, an aqueous form of sulphur, must also be oxidized to become plant available. Oxidation of ammonium thiosulphate occurs rapidly, becoming available to plants in the season of application.

Sulphur is an important nutrient for high-yielding alfalfa. Scout alfalfa fields early and apply ammonium sulphate immediately if sulphur deficiency symptoms are noticed to assist the alfalfa recovery and protect yield. ☼

Forage Crop Production Outlook 2009

By Michel Tremblay, Provincial Specialist, Forage Crops

These days it is pretty risky trying to forecast anything, be it the weather, financial markets or energy prices. Many experts have been proven wrong over the last little while. Predicting what will happen in Saskatchewan's hay industry can sometimes be just as tricky. Ultimately, any market is defined by the fundamentals of supply and demand.

Factors that influence production and the beef cattle market, the primary consumer of Saskatchewan's forage production, are the primary forces determining hay prices. Some of the factors that will contribute to hay prices are discussed below:

Precipitation

Fall, winter and spring precipitation are the major factors contributing to forage yields. Snow accumulation helped to recharge soil moisture levels in many areas over the winter, but the western side of the province continues to have fair to poor soil moisture levels. Surface soil moisture levels continue to decline in many areas due to minimal rainfall this spring. Rainfall within the next few weeks will be required to achieve an average hay crop in dry areas.

Provincial stubble subsoil moisture levels can be viewed at: www.agriculture.gov.sk.ca/Production. Follow the link to Crops – Seeding, then *Stubble Subsoil Moisture Map*.

Temperature

Like annual crops, forages require heat to grow and develop. This spring has been cool and growth of forages has been about two weeks later than normal. Cool season perennial forage species achieve the majority of their growth early in the season. Continued cool temperatures will likely reduce first cut hay yields.

The long winter of 2008-2009 has resulted in accelerated reduction of hay supplies. Source: Saskatchewan Agriculture.

Carryover Feed Supplies

From 2004 to 2007, hay yields in Saskatchewan were above average, which resulted in growing hay inventories and downward pressure on prices. Yields were moderate last year, with most regions reporting average or below average yields. The last two winters were cold, drawing down feed supplies. The cool spring experienced last year and now this year has delayed cattle turn out and has lengthened the feeding period. Some hay moved into Manitoba to backfill for significantly lower hay production in the province last year due to flooding. All these factors have reduced hay supplies and have caused an upward trend in hay prices early in this year.

(Continued on page 7)

Forage Crop Production Outlook 2009
(Continued from page 6)

Livestock market trends
Many factors have been influencing cattle markets recently. Profitability, or lack thereof, will eventually impact on feed markets. Recently, reduced profitability has resulted in a reduction in herd size. From January 1, 2008 to January 1, 2009 the number of cattle and calves in Saskatchewan decreased from 2.87 million head to 2.65 million head, a reduction of eight per cent. More recently, cattle prices have been improving with 400-500 pound steers selling for an average of $125.86/hwt in mid-May, compared to $104.31/hwt in mid-May of 2008. D1 and D2 cow average prices increased from $35-59/hwt to $46.75-60/hwt during the same period. In the short term, the herd reduction will result in less demand for feed.

Annual crop market trends
Perennial forage acres sat at historic highs until high cereal, oilseed, and pulse crops increased competition for acres in late 2007 and going into 2008. Forage acres were removed and replaced with annual crops. Reduced forage acres will result in reduced hay supplies. Adverse weather can result in damaged field crops being salvaged as feed, but few frost or weather-damaged annual crops have moved into the feed market over the last couple of years. Of course, poor harvest weather can change the dynamics of the feed market quickly.

Conclusion
Many factors influence hay prices. In 2009, supplies of carryover hay are relatively low, and growing conditions so far have not been favourable for development of above average hay yields. On the demand side, the provincial herd size has decreased over the last year, resulting in increased demand. Although cattle prices have improved somewhat recently, ultimately the level of profitability of cattle production will dictate how high hay prices will go. ☼

Phosphate, sulphur deficiencies and in-crop nitrogen considerations

By Ken Panchuk, Provincial Specialist, Soils

Phosphate
Selecting an earlier maturing crop/variety, increasing the seeding rate and adding starter phosphate fertilizer form an agronomic package that will give producers the best chance of hastening maturity. Remember, other macronutrients that are deficient also need to be added in the correct amounts to create a balance of nutrients for optimum crop health and productivity.

Under Saskatchewan conditions, whether in early May or even when seeding is delayed into June, adding starter phosphate fertilizer is a good decision. The focus has now turned from cool soil conditions to one of hastening maturity.

(Continued on page 8)

Phosphate, sulphur deficiencies, and in-crop nitrogen considerations.
(Continued from page 7)

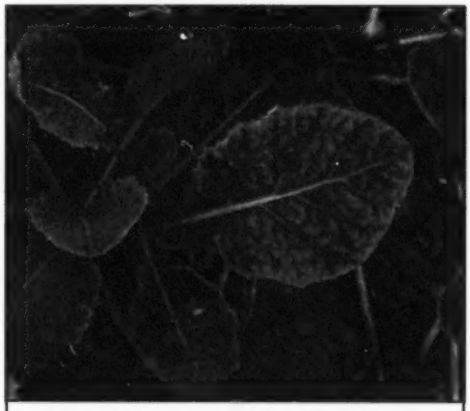
The fact that phosphate is needed for early, healthy root development remains true even for late seeding. Getting the plant established sooner is part of the strategy for hastening maturity. In June with good soil moisture, long day length, and heat, plants will be growing very rapidly. Phosphorus, which is essential for cell division and energy transfer within plant tissue, will be required in large quantities. Producers can't afford to have sluggish seedling growth in June limited by low phosphorus availability in the first weeks of plant growth when plant root systems are small.

Follow the guidelines for safe rates of phosphate when applying it in the seed row to minimize the risk of seedling damage.

For more information go to:
www.agriculture.gov.sk.ca/Production. Follow the link to Crops – Fertilizer/Nutrients, then *Phosphorous Fertilization in Crop Production* and/or *Guidelines for safe rates of fertilizer applied with the seed.*

Correcting In-Crop Sulphur Deficiencies for Canola and Mustard

Plants use sulphur in the sulphate form. A deficiency of sulphur at any growth stage can cause considerable reduction in yield because sulphur is not mobile in plants. If sulphur deficiencies were not adequately corrected as part of the seeding plans for canola and mustard, then action must be taken as soon as sulphur deficiency symptoms are noticed.



Sulphur deficiency symptoms in canola.
Source: International Plant Nutrition

Sulphur deficiency symptoms in canola include:

- Cupping upward of leaves;
- Interveinal yellowing of the newest leaves in earlier stages of growth;
- Spindly plants;
- Cupped leaves with purpling on the underside usually at the fringes;
- Pale yellow flowers;
- Poor pod development and poor filling in advanced stages of growth; and
- Delayed maturity (after a slow start this spring, because of cool conditions, an unnecessary delay in maturity may be costly).

The key point is to take corrective action soon after identifying the deficiency symptoms. Research has shown that a sulphate form of sulphur (ammonium sulphate) can be applied any time after seeding until about 10 per cent flower to mid-bloom stage to correct a sulphur deficiency in canola or mustard. The earlier the ammonium sulphate is applied the better the chance of recovering the yield. Hence, frequent field scouting during the early growth stages is critical for optimizing yield of canola and mustard.

(Continued on page 9)

Phosphate, sulphur deficiencies, and in-crop nitrogen considerations.
(Continued from page 8)

In-Crop Application of Nitrogen
Under Saskatchewan conditions, the best approach is to have all of the nutrients applied at the levels needed to correct deficiencies for realistic target yields by the time seeding is completed. This may occur during one-pass direct seeding, or fall and/or spring banding of nitrogen. However, at seeding time it is difficult to predict if markets will improve, if protein premiums are going to be high, or if rain will come and improve the yield potential of the crop.

In-crop application of nitrogen gives the flexibility to make in-crop management adjustments to keep the crop performing at optimum levels. There are several application methods for applying in-crop nitrogen onto the soil surface, e.g. broadcasting urea with a urease inhibitor for N- volatilization protection, broadcasting polycoated urea or dribble banding liquid nitrogen with drop tubes or split nozzles.

No matter which method is used to apply additional nitrogen, the key is to apply the nitrogen in the earlier growth stages to capture as much yield as possible and to help capture extra protein in wheat. Rain will be needed to move the nitrogen into the soil. ☼

Crop Development in Cool Conditions

By Ken Panchuk, Provincial Specialist, Soils,
Dale Risula, Provincial Specialist, Special Crops,
and Sherrilyn Phelps, Regional Crop Specialist, North Battleford Regional Office

This May has been a cool one, both with the weather and soil temperatures. With low soil temperature for germination, several things happen to emerging crops: the number of days from seeding to emergence is longer; field mortality of the seed is higher and plant stands are reduced due to increased seedling blights, damping off, and root rots; and emerged seedlings are sluggish and turn pale green to slightly yellow or even purple.

The advantage of having a cooler May with lower daytime temperatures is that some cold-hardening of emerging seedlings occurred, reducing the potential damage from near freezing to freezing temperatures.

Spring frosts can damage germinating seedlings and the extent of damage will depend on the location of the growing point (above or below ground) and the exposure to cooler temperatures over time. Plants are able to resist injury if the temperature changes are gradual or are only encountered for a short period of time. Dry soil conditions and high winds can also aggravate frost injury while moist soils or heavy dews can reduce the effects. Plants that are growing rapidly are damaged more by frost in comparison to those that are growing slowly. Plants can lose their hardened condition and improved tolerance to frost after exposure to warm temperatures and good growing conditions.

(Continued on page 10)

Crop Development in Cool Conditions

(Continued from page 9)

Flax

Flax is quite sensitive to frost and displays the classic symptoms of cool or wet soil conditions by expressing obvious yellowing of the tops of the seedlings (see photo). Flax becomes more tolerant to frost as it develops and can withstand temperatures down to -7°C if the plants have been hardened.

Leaf yellowing of flax resulting from cold or wet soils.
Source: Flax Council of Canada.

Pulses

Pea and lentil seedlings can withstand some late spring frost. Even if the frost is severe enough to kill the main above-ground tissue, peas and lentils have at least one growing point (node) that remains below ground during early development. New growth will resume from these below-ground nodes and will appear approximately seven to 10 days after the frost. With re-growth there is usually little impact on yield but maturity may be delayed.

Frost damage to wheat showing typical leaf tip die back. (File Photo).
Source: Saskatchewan Agriculture.

Wheat seedling showing pale green/yellowing (May 25, 2009).
Source: Saskatchewan Agriculture.

Cereals

Cereal crops appear pale green under cool emergence conditions. This year wheat displayed some yellowing as a result of May nights with several hours at or near freezing temperatures. Frost banding of cereal leaves may appear in patches within a field, these bands are similar to heat banding but are usually darker brown in color.

(Continued on page 11)

Crop Development in Cool Conditions
(Continued from page 10)

The growing point of cereals is below ground until approximately the 5-leaf or jointing stage. This protects the plant from severe frost injury in the spring. Plants may lose above-ground leaf matter but will re-grow from below ground. Partial injury can be seen when the leaf tips or edges become damaged, yellow and then turn brown and brittle. Cereals will tolerate frosts down to -4°C and -6°C if the plants have been hardened.

Canola

In canola, the growing point is okay above ground between the cotyledons, but a light frost that burns the leaves might not injure the growing point. Hardened canola plants can tolerate temperatures down to -7 °C or more. AAFC Beaverlodge research showed that canola can tolerate temperatures of -8 to -12 °C if fall seeded or early spring seeded. If there is re-growth or green material at the growing point then the plants will recover. Several days to a week or more after a frost is needed to determine the re-growth potential before conducting plant stand counts.

Scouting of emerging crops is important to assess crop health and seedling recovery after cold temperatures. Seedlings will green up and show improved growth as the soil temperature warms up improving root growth and access to soil and fertilizer nutrients.
☼

For information about submitting samples to Saskatchewan Agriculture's Crop Protection Lab, go to:
www.agriculture.gov.sk.ca/programs-services
(Scroll down to Crop Protection Laboratory Services or phone (306) 787-8130).

Authority Registration Update

By Venkata Vakulabharanam, Provincial Specialist, Oilseed Crops

Authority 480 (Sulfentrazone) - Group 14 - is a selective soil-applied herbicide for control of wild buckwheat, kochia, lamb's quarters and redroot pigweed. An application was made this spring for the emergency registration of Authority in field pea, flax and sunflower in the prairies as well as to extend the chickpea registration in Alberta. In 2008, the Pest Management Regulatory Agency (PMRA) approved the registration of Authority on chickpea only in Saskatchewan. In 2009, the PMRA also approved the emergency use registration of Authority on chickpea in Alberta.

FMC of Canada, Ltd. is conducting further studies this year to fulfill the requirement for full registration of Authority in Canada. They hope to submit all necessary data to PMRA this fall to obtain full registration. FMC plans to pursue registration of Authority herbicide on field pea, flax and sunflower. For 2009 it can only be used on chickpea in Saskatchewan and Alberta.

Consult the Authority label for precautions regarding use in sandy soils or areas with a shallow water table and low organic matter and crop rotation restrictions. For the current Authority product label, please go to:

http://pr-rp.pmra-arla.gc.ca/PR_SOL/pr_web.ve1?p_ukid=14545 ✿

The ***Crop Production News*** is a publication of the
Crops Branch, Saskatchewan Ministry of Agriculture.
Editors: Ray McVicar and Faye Dokken;
Phone: (306) 787-8733 and (306) 787-4671;
e-mail: ray.mcvicar@gov.sk.ca and faye.dokken@gov.sk.ca